

7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding 1,1,1-trichloroethane in air, water, and other media are summarized in Table 7-1.

ATSDR has derived an MRL of 2 ppm for acute inhalation exposure (14 days or less) to 1,1,1-trichloroethane, based on a LOAEL of 175 ppm for reduced performance of psychomotor tests in human volunteers in a study by Mackay et al. (1987).

ATSDR has derived an intermediate inhalation MRL of 0.7 ppm for 1,1,1-trichloroethane based on a study by Rosengren et al. (1985) which found evidence of astrogliosis (increased glial fibrillary acid protein levels) in the brains of gerbils exposed to 210 or 1,000 ppm, but not 70 ppm, of 1,1,1-trichloroethane continuously for 3 months.

Neither a reference dose nor a reference concentration for 1,1,1-trichloroethane are available at this time.

1,1,1-Trichloroethane is on the list of chemicals appearing in “The Emergency Planning and Community Right-to-Know Act of 1986” (EPCRA) (EPA 19881). Section 313 of Title III of EPCRA requires owners and operators of certain facilities that manufacture, import, process, or otherwise use the chemicals on this list to report annually their release of those chemicals to any environmental media.

OSHA requires employers of workers who are occupationally exposed to 1,1,1-trichloroethane to institute engineering controls and work practices to reduce and maintain employee exposure at or below permissible exposure limits (PEL). The employer must use engineering and work practice controls, if feasible, to reduce exposure to or below an 8-hour time-weighted average (TWA) of 350 ppm. Respirators must be provided and used during the time period necessary to install or implement feasible engineering and work practice controls (OSHA 1989).

1,1,1-Trichloroethane is regulated by the Clean Water Effluent Guidelines as stated in Title 40, Sections 400-475, of the Code of Federal Regulations. 1,1,1-Trichloroethane is regulated as a group of chemicals controlled as Total Toxic Organics, and has specific effluent limitations, The point

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source categories for which 1,1,1-trichloroethane is controlled as a Total Toxic Organic include electroplating and metal finishing (EPA 1981e, 1983c). The point source category for which 1,1,1-trichloroethane has specific effluent limitations is organic chemicals, plastics, and synthetic fibers (EPA 1987f, 19878).

According to the 1990 Clean Air Act Amendments and the Montreal Protocol, U.S. production of 1,1,1-trichloroethane will be cut incrementally until the proposed phase out occurs by January 1996 (EPA 1993n).

Under the Resource Conservation and Recovery Act (RCRA), 1,1,1-trichloroethane is as a hazardous waste in three categories: (1) wastes from non-specific sources; (2) wastes from specific sources; and (3) discarded commercial chemical products, off-specification species, container residues, and spill residues thereof (EPA 1980c, 1981a, 1981b).

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane

Agency	Description	Information	References
<u>INTERNATIONAL</u>			
IARC	Carcinogenic classification	Group 3 ^a	IARC 1987
<u>NATIONAL</u>			
Regulations:			
a. Air:			
EPA	Listed as hazardous air pollutant (HAP)	Yes	U.S. Congress 1990
OSHA	PEL TWA	350 ppm (1,900 mg/m ³)	29 CFR 1910.1000 (54 FR 2923) OSHA 1989
EPA OAR	Definition of Volatile Organic Compound (VOC)	Yes	40 CFR 51.100 EPA 1986f
	Subpart X - EPA Approval of MI's SIP: Coating Exclusion	Yes	40 CFR 52.1170 EPA 1972a
	Subpart RR - EPA Approval of TN's SIP: Definition of VOC	Yes	40 CFR 52.2222 EPA 1980d
	Subpart YY - EPA Approval of WI's SIP: Partial Exemption from VOC Control Requirements	Yes	40 CFR 52.2570 EPA 1972b
	Approval and Promulgation of Implementation Plan; WI (Proposed)	Yes	40 CFR 52 (59 FR 9158) EPA 1994a
	Approval and Promulgation of Implementation Plans: Revision to NJ SIP (Proposed)	Yes	40 CFR 52 (58 FR 38326) EPA 1993a
	Designation as a HAP	Yes	40 CFR 61.01 (50 FR 24314) EPA 1985c
	NESHAP for Halogenated Solvent Cleaning (Proposed)	Yes	40 CFR 63 (58 FR 62566) EPA 1993b
	NESHAP for Pulp and Paper Production (Proposed)	Yes	40 CFR 63 (58 FR 66078) EPA 1993c
	HAPs: Regulations Governing Constructed, Reconstructed or Modified Major Sources (Proposed)	Yes	40 CFR 63 (59 FR 15504) EPA 1994b
	Protection of Stratospheric Ozone: Baseline Production Allowances	Yes	40 CFR 82.5 EPA 1988e
	Availability of Production Allowances in Addition to Baseline Production Allowances	Yes	40 CFR 82.9 EPA 1988f
	App. A - Class I Controlled Substances	O ₃ depletion wt. = 0.1	40 CFR 82 EPA 1991f
	App. F - Listing of Ozone Depleting Chemicals	Yes	40 CFR 82 EPA 1993d

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
	Labelling of Products Using Ozone Depleting Chemicals: Definitions	Yes	40 CFR 82.104 EPA 1993e
	Warning Statement Requirement	Yes	40 CFR 82.106 EPA 1993f
	Form of Label Bearing Warning Statement	Yes	40 CFR 82.110 EPA 1993g
	Labelling Supplemental Proposal (Proposed)	Yes	40 CFR 82 (58 FR 69568) EPA 1993h
	Certification, Recordkeeping, and Notice Requirements	Yes	40 CFR 82.122 EPA 1993i
b. Water			
EPA OGWDW	MCL in drinking water	0.2 mg/L	EPA 1994c
EPA OW	Designation of Hazardous Substances	Yes	40 CFR 116.4 EPA 1978a
	App. D - NPDES Permit Application Testing Requirement	Yes	40 CFR 122 EPA 1978b
	NPDES, Form 2D	Yes	40 CFR 122 EPA 1983a
	NPDES Instruction Form 2c	Yes	40 CFR 125 EPA 1979a
	Method 624 - Purgeables	Yes	40 CFR 136 EPA 1979b
	Method 1624 - Volatile Organic Compounds by Isotope Dilution GC/MS	Yes	40 CFR 136 EPA 1979c
	National Primary and Secondary Drinking Water Regulations: Analytical Methods - Organic Chemicals (Proposed)	Yes	40 CFR 141 (58 FR 65622) EPA 1993j
	App. C - Analysis of Trichloromethanes	Yes	40 CFR 141 EPA 1979d
	Registration Policies and Interpretations: Substances Determined to be Chemically Inert	Yes	40 CFR 153.139 EPA 1988g
	Tolerances and Exemptions from Tolerances for Pesticide Chemicals in or on Raw Agricultural Commodities: Exemptions from Tolerances	Yes	40 CFR 180.1001 EPA 1971a
	1,1,1,-Trichloroethane - Exemption from the Requirement of a Tolerance	Yes	40 CFR 180.1012 EPA 1971b
	Effluent Guidelines and Standards: Electroplating - Definition of Total Toxic Organic	>0.01 mg/L	40 CFR 413.02 EPA 1981c
	Organic Chemicals, Plastics, and Synthetic Fibers - Description of Bulk Organic Chemicals Subcategory	Yes	40 CFR 414.70 EPA 1992g

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
	Organic Chemicals, Plastics, and Synthetic Fibers - Toxic Pollutant Effluent Limitation and Standards for Direct Discharge Point Sources That Do Not Use End of Pipe Biological Treatment	Yes	40 CFR 414.91 EPA 1987g
	- maximum for any one day	54 µg/L	
	- maximum for monthly avg.	21 µg/L	
	Organic Chemicals, Plastics, and Synthetic Fibers - Toxic Pollutant Effluent Limitation and Standards for Direct Discharge Point Sources That Do Not Use End-of-Pipe Biological Treatment		40 CFR 414.101 EPA 1987h
	- maximum for any one day	59 µg/L	
	- maximum for monthly avg.	22 µg/L	
	Effluent Guidelines and Standards - Metal Finishing - Definition of Total Toxic Organic	>0.01 mg/L	40 CFR 433.11 EPA 1983b
	App. A - 126 Priority Pollutants	Yes	40 CFR 423 EPA 1982b
c. Food EPA	Tolerances and exemptions from tolerances for pesticide chemicals in or on raw agricultural commodities:	Yes	HSDB 1994
	No tolerances for residue listed		
	Exempted when used in the post-harvest fumigation of citrus fruits		
d. Other:			
EPA OERR	Reportable quantity	1,000 pounds	40 CFR 302.4 EPA 1988h
EPA OPP	Intent to Cancel, Restrict or Require Reregistration of Pesticide Products Containing 1,1,1-Trichloroethane (methyl chloroform)	No ^b	EPA 1993m
EPA OPTS	Specific Toxic Chemical Listings - Chemicals and Chemical Categories to Which this Subpart Applies	Yes	40 CFR 372.65 EPA 1988i
	Procedures Governing Testing Consent Agreement and Test Rules: Submission of Information	Yes	40 CFR 790.5 EPA 1985d
	Identification of Specific Chemical Substance and Mixture Testing Requirements: Submission of Information	Yes	40 CFR 799.5 EPA 1988j
	Identification of Specific Chemical Substance and Mixture Testing Requirements: 1,1,1-Trichloroethane	Yes	40 CFR 799.4400 EPA 1984b
EPA OSW	App. I - Criteria for Classification of Solid Waste Disposal Facilities and Practices: Maximum Contaminant Levels	Yes	40 CFR 257 EPA 1979e

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>NATIONAL (cont.)</u>			
	App. I - Criteria for Municipal Solid Waste Landfills: Constituents for Detection Monitoring	Yes	40 CFR 258 EPA 1991g
	Definition of Hazardous Waste	Yes	40 CFR 261.3 EPA 1992h
	Hazardous Waste from Non-specific Sources (F001, F002, F024, F025)	Yes	40 CFR 261.31 EPA 1981a
	Hazardous Waste from Specific Sources (K019, K020, K028, K029, K096)	Yes	40 CFR 261.32 EPA 1981b
	Listed Hazardous Waste (U226)	Yes	40 CFR 261.33 EPA 1980c
	App. VII - Basis for Listing Hazardous Waste	Yes	40 CFR 261 EPA 1981d
	App. VIII - Hazardous Constituents	Yes	40 CFR 261 EPA 1980d
	App. IX - Wastes Excluded from Non-specific Sources	Yes	40 CFR 261 EPA 1984a
	App. IX - Groundwater Monitoring List	Yes	40 CFR 264 EPA 1987i
	App. VIII - Potential PICs for Determination of Exclusion of Waste-Derived Residues	Yes	40 CFR 266 EPA 1991h
	LDR - Wastes to be Evaluated by August 8, 1988	Yes	40 CFR 268.10 EPA 1986g
	Constituent Concentrations in Wastes		40 CFR 268.43 EPA 1988k
	F001 - F005	0.054 mg/L (ww) 5.6 mg/L (nonww)	
	F039	0.054 mg/L (ww) 5.6 mg/L (nonww)	
	K018, K019, K028, K029	0.054 mg/L (ww.) 6.0 mg/L (nonww)	
	K073	0.054 mg/L (ww) 6.2 mg/L (nonww)	
	U226	5.6 mg/L (nonww)	
Guidelines:			
a. Air:			
ACGIH	TLV TWA STEL BEI (in end-exhaled air)	350 ppm (1,910 mg/m ³) 450 ppm (2,460 mg/m ³) 40 ppm	ACGIH 1992
NIOSH	Ceiling (REL)	350 ppm (1,910 mg/m ³)	HSDB 1992
b. Water:			
EPA ODW	MCLG (final) Health Advisories:	0.2 mg/L	EPA 1994c
	1-day	100 mg/L	EPA 1994c
	10-day	40 mg/L	
	Longer-term (child)	40 mg/L	
	Longer term (adult)	100 mg/L	
	Lifetime	0.2 mg/L	

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
NATIONAL (cont.)			
EPA OWRS	Ambient Water Quality Criteria for Protection of Human Health: Ingesting water and organisms: Ingesting organisms only:	1.84x10 ⁴ µg/L 1.03 µg/L	IRIS 1994
NAS	SNARL	490 mg/L (24 hour)	NAS/NRC 1980
c. Other EPA	Carcinogen classification	Group D ^c	IRIS 1994
STATE			
Regulations and Guidelines:			
a. Air:	Acceptable ambient concentration guidelines or standards		NATICH 1992
AZ		2.00x10 ⁴ µg/m ³ (1 hour) 1.10x10 ³ µg/m ³ (24 hour)	
CT		3.80x10 ⁴ µg/m ³ (8 hour)	
FL-Ftldle		3.80x10 ¹ mg/m ³ (8 hour)	
FL-Pinella		3.82x10 ⁴ µg/m ³ (8 hour) 9.16x10 ³ µg/m ³ (24 hour)	
IN		1.90x10 ⁴ µg/m ³ (8 hour)	
IN-Innap		1.90x10 ⁴ µg/m ³ (8 hour)	
LA		4.55x10 ³ µg/m ³ (8 hour)	
MA		1.04x10 ³ µg/m ³ (24 hour) 1.04x10 ³ µg/m ³ (annual)	
ME		2.50x10 ⁵ µg/m ³ (15 min.) 1.00x10 ⁴ µg/m ³ (24 hour) 1.00x10 ³ µg/m ³ (1 year)	
NC/Forco		1.20 mg/m ³ (24 hour) 2.45x10 ² mg/m ³ (15 min)	
ND		1.91x10 ¹ mg/m ³ (8 hour) 2.46x10 ¹ mg/m ³ (1 hour)	
NV		4.52x10 ¹ mg/m ³ (8 hour)	
NY		3.80x10 ⁴ µg/m ³ (1 year)	
OK		1.91x10 ⁵ µg/m ³ (24 hour)	
SD		3.80x10 ⁴ µg/m ³ (8 hour)	
TX		1.91x10 ⁴ µg/m ³ (30 min)	
VA		1.91x10 ³ µg/m ³ (annual)	
VT		3.20x10 ⁴ µg/m ³ (24 hour)	
WA-SWEST		1.90x10 ⁵ µg/m ³ (8 hour) 6.33x10 ³ µg/m ³ (24 hour)	
b. Water:			
	Water Quality Criteria: Human		CELDs 1994
AL	Water and fish consumption	200 µg/L	
AZ	Drinking water Fish consumption Full body contact Partial body contact	200 µg/L 160,000 µg/L 13,000 µg/L 13,000 µg/L	
CA	30-day average - maximum	540 mg/L 0.200 mg/L	

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>STATE (Cont.)</u>			
CT	Drinking water	2.0 µg/L	
DE	Freshwater fish consumption	200 mg/L	
	Freshwater fish and water consumption	200 mg/L	
	Marine/estuarine fish/shellfish consumption	28 mg/L	
	Drinking water	0.20 mg/L	
FL	Drinking water	02.mg/L	
GA	Drinking water	0.2 mg/L	
HI	Fish consumption	340,000 µg/L	
IA	Drinking water	0.20 mg/L	
ID	Drinking water	0.20 mg/L	
IL	Drinking water	0.20 mg/L	
IN	Outside of mixing zone (4-day avg.)	1,030,000 µg/L	
	Point of water intake	18,400 µg/L	
KY	Fish consumption	1,030,000 µg/L	
	Domestic water supply source	18.4 mg/L	
LA	Drinking water	200 µg/L	
	Non-drinking water	31.34 mg/L	
MA	Drinking water	0.20 mg/L	
MN	Drinking water	0.20 mg/L	
MO	Drinking water	0.20 mg/L	
	Drinking water supply	200 µg/L	
MT	Drinking water	0.20 mg/L	
NC	Drinking water	020 mg/L	
ND	Drinking water	0.20 mg/L	
NE	Maximum contaminant levels	0.2 mg/L	
NM	Drinking water	0.20 mg/L	
OH	Drinking water	0.20 mg/L	
	Outside mixing zone (max.)	2,000 µg/L	
	30-day avg.	88 µg/L	
	Human Health (30-day avg.)	1,030,000 µg/L	
OK	Inside mixing zone (max.)	3,900 µg/L	
	Drinking water	0.20 mg/L	
OR	Fish and water consumption	18.4 mg/L	
	Fish consumption	1.03 g/L	
PR	Drinking water	0.20 mg/L	
RI	Drinking water	0.20 mg/L	
SC	Drinking water	0.20 mg/L	
SD	Domestic water	200 µg/L	
	All other uses	1,030,000 µg/L	

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>STATE (Cont.)</u>			
TN	Domestic raw water supply	200 µg/L	
TX	Drinking water	200 µg/L	
UT	Drinking water	0.2 mg/L	
VA	Drinking water	0.2 mg/L	
VT	Class A or B waters Class C waters	18.4 mg/L 1.03 g/L	
WI	Drinking water Maximum contaminant levels Public water supplies: - warm water sport fish communities - coldwater communities - Great Lakes communities Non-public water supplies: - warm water sport fish communities - cold water sport fish communities - Great Lakes communities	0.20 mg/L 0.2 mg/L 0.2 mg/L 0.2 mg/L 0.2 mg/L 0.2 mg/L 33 mg/L 11 mg/L 200 mg/L	
WV	Drinking water	0.20 mg/L	
	Water Quality Criteria: Aquatic Life		CELDs 1994
AZ	Acute - cold water fishery Acute - warm water fishery Acute - effluent dominated water Chronic - cold water fishery Chronic - warm water fishery Chronic - effluent dominated water	2,600 µg/L 2,600 µg/L 2,600 µg/L 1,600 µg/L 1,600 µg/L 1,600 µg/L	
HI	Acute - freshwater Acute - saltwater	6,000 µg/L 10,400 µg/L	
LA	Acute - freshwater Acute - marine Chronic - freshwater Chronic - marine	5,280 µg/L 3,120 µg/L 2,640 µg/L 1,560 µg/L	
NJ	Freshwater Saltwater	18,000 µg/L 31,200 µg/L	
OH	Outside mixing zone, maximum Outside mixing zone, 30-day avg. Outside mixing zone, human health Inside mixing zone	2,000 µg/L 88 µg/L 1,030,000 µg/L 3,900 µg/L	
OR	Acute - marine	312,000 µg/L	
	Water Quality Criteria: Recreational Uses		CELDs 1994
TN		170,000 µg/L	
	Groundwater Quality Standards		CELDs 1994
AZ		0.2 mg/L	
CO		200 µg/L	
MO		200 µg/L	

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>STATE (Cont.)</u>			
NC		0.2 mg/L	
NM		0.06 mg/L	
OK		0.3 mg/L	
OR		0.2 mg/L	
UT		0.2 mg/L	
WI	Enforcement Standard Preventive Action	200 µg/L 40 µg/L	
	Groundwater Quality Monitoring Parameters		CELDs 1994
AL		Yes	
CO		Yes	
IL		Yes	
KY		Yes	
LA		Yes	
MN		Yes	
NY		Yes	
SC		Yes	
TN		Yes	
TX		Yes	
VA		Yes	
WI		Yes	
WV		Yes	
	Discharge Limits		CELDs 1994
NJ	NPDES permits: testing requirements for organic toxic pollutant	Yes	
SD	Surface water discharge permit application requirements: Test requirements for organic toxic pollutants	Yes	
WI	Maximum allowable concentration = BAT effluent	Yes	
c. Other			CELDs 1994
	Hazardous Waste Toxicity Characteristics		
TX	Maximum Leachable Concentration	300 mg/L	
	Hazardous Waste Constituents		CELDs 1994
AL		Yes	
CA		Yes	
CO		Yes	

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TABLE 7-1. Regulations and Guidelines Applicable to 1,1,1-Trichloroethane (continued)

Agency	Description	Information	References
<u>STATE (Cont.)</u>			
GA		Yes	
IL		Yes	
KY		Yes	
LA		Yes	
MA		Yes	
MD		Yes	
MN		Yes	
MT		Yes	
ND		Yes	
NE		Yes	
NH		Yes	
NY		Yes	
OH		Yes	
SC		Yes	
SD		Yes	
VA		Yes	
VT		Yes	
WI		Yes	
WV		Yes	

*Group 3: Not classifiable as to carcinogenicity in humans.

^bThe current Status of Pesticides in Reregistration and Special Review, March 1992 declares reregistration of products containing methyl chloroform is unsupported.

^cGroup D: Not classifiable as to carcinogenicity in humans.

ACGIH = American Conference of Governmental Industrial Hygienists; BAT = Best Available Technology; BEI = Biological Exposure Index; EPA = Environmental Protection Agency; GC/MS = Gas Chromatogram/Mass Spectrometry; IARC = International Agency for Research on Cancer; LDR = Land Disposal Restrictions; MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; NIOSH = National Institute for Occupational Safety and Health; NPDES = National Pollutant Discharge Elimination System; ODW = Office of Drinking Water; OERR = Office of Emergency and Remedial Response; OGWDW = Office of Groundwater and Drinking Water; OPP = Office of Pesticides Program; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Waste; OTS = Office of Toxic Substances; OWRS = Office of Water Regulations and Standards; PEL = Permissible Exposure Level; PIC = Products of Incomplete Combustion; REL = Recommended Exposure Level; SIP = State Implementation Plan; SNARL = Suggested No Adverse Response Level; STEL = Short-term Exposure Limit; TLV = Threshold Limit Value; TWA = Time-Weighted Average; ww = wastewater; nonww = non-wastewater

